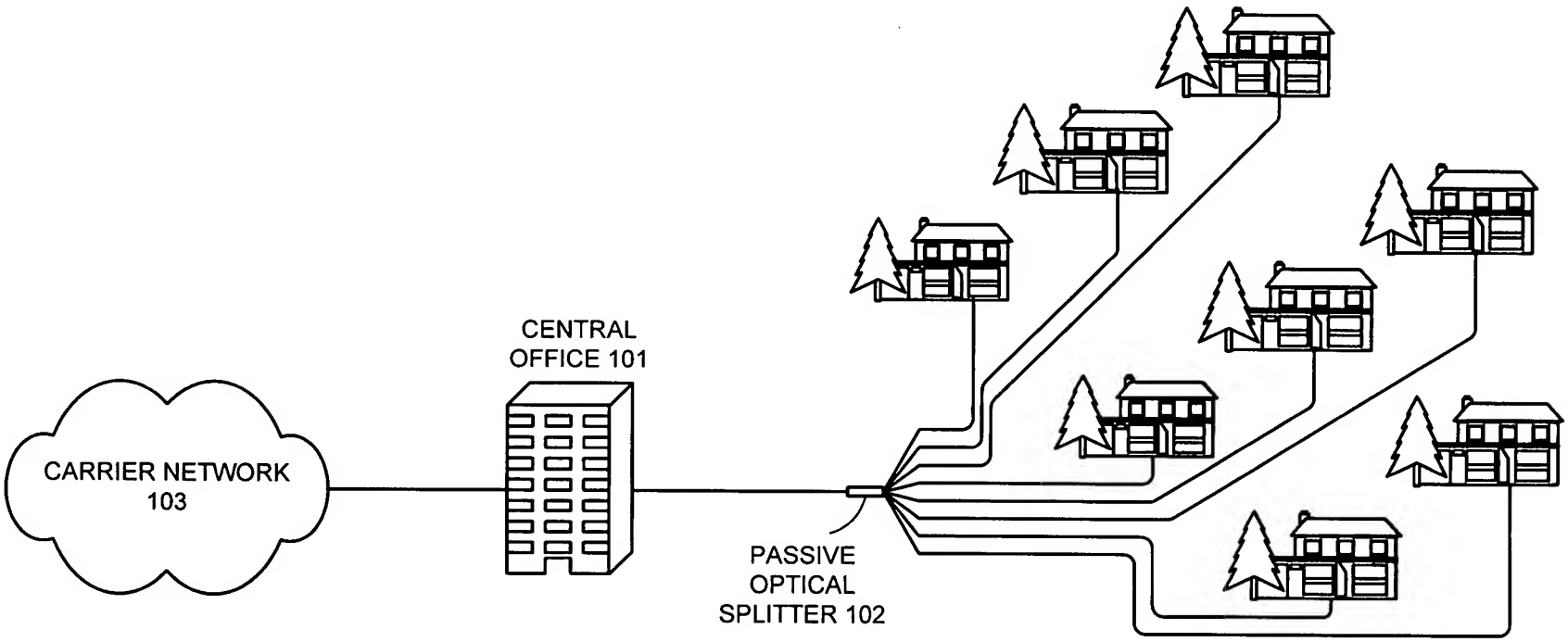

FIG. 1 (PRIOR ART)

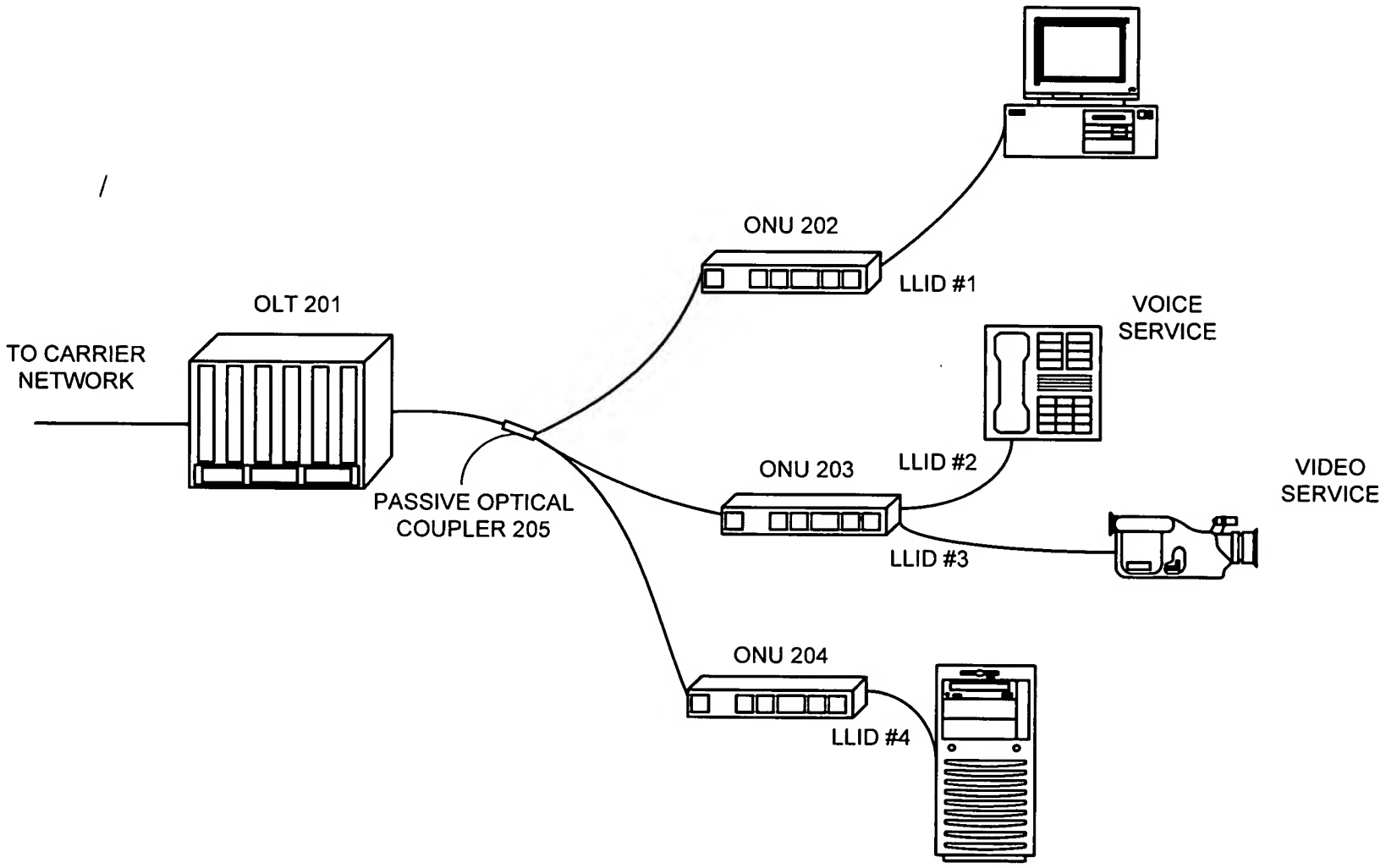

FIG. 2 (PRIOR ART)

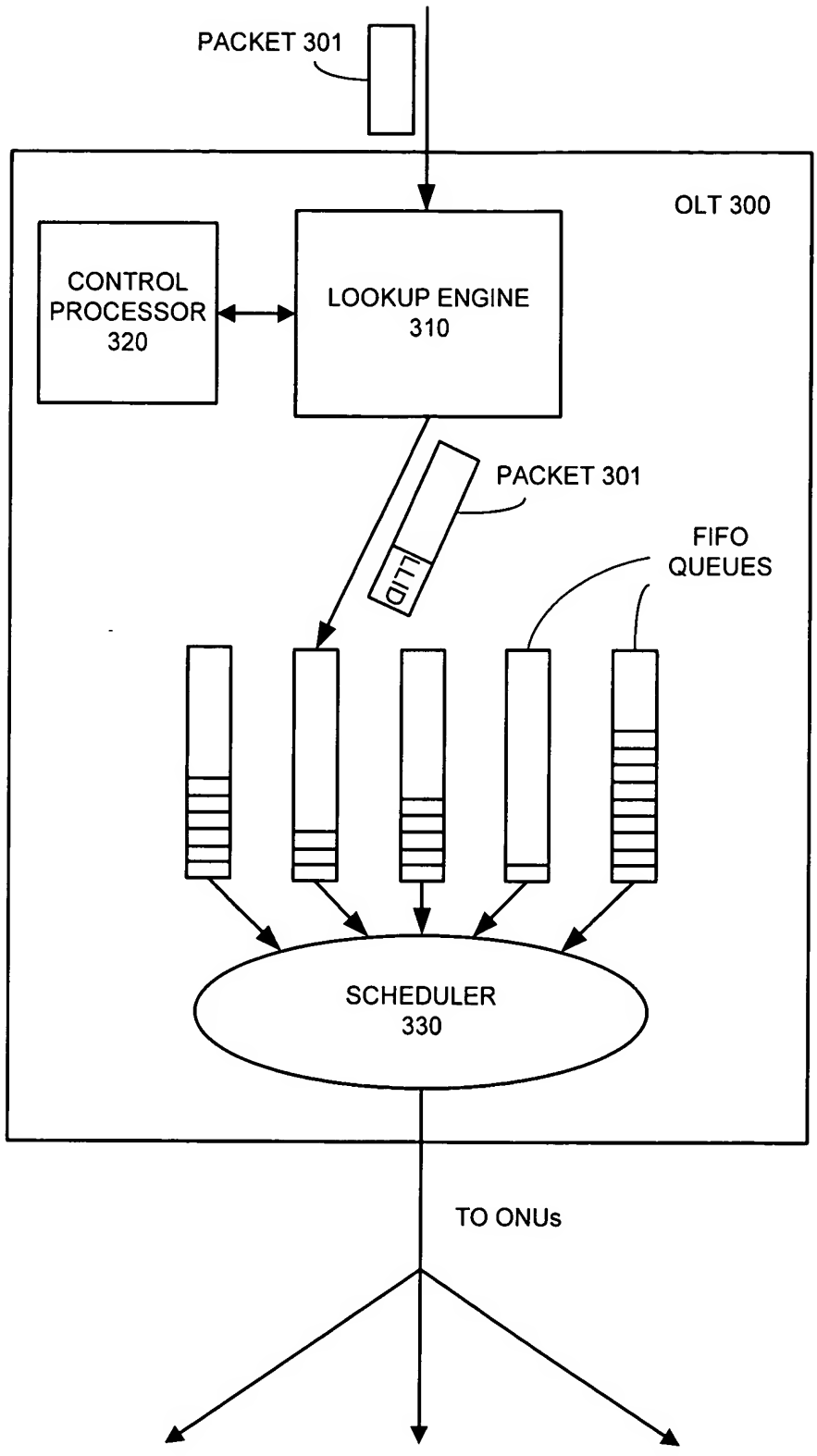
PACKET 301
OLT 300
CONTROL PROCESSOR 320
LOOKUP ENGINE 310
PACKET 301
LID
FIFO QUEUES
SCHEDULER 330
TO ONUs

FIG. 3

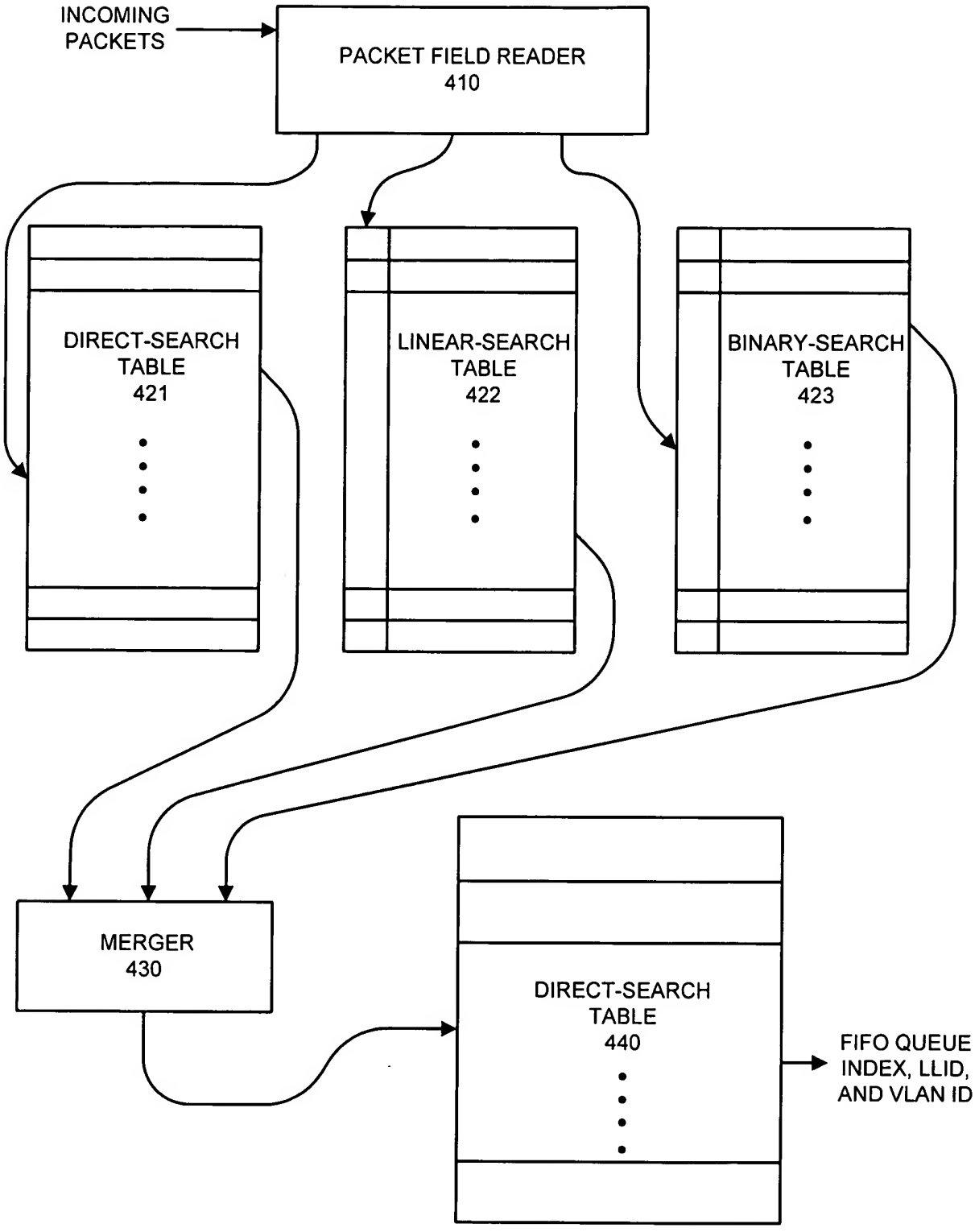
INCOMING PACKETS
PACKET FIELD READER 410
DIRECT-SEARCH TABLE 421
LINEAR-SEARCH TABLE 422
BINARY-SEARCH TABLE 423
MERGER 430
DIRECT-SEARCH TABLE 440
FIFO QUEUE INDEX, LLID, AND VLAN ID

FIG. 4

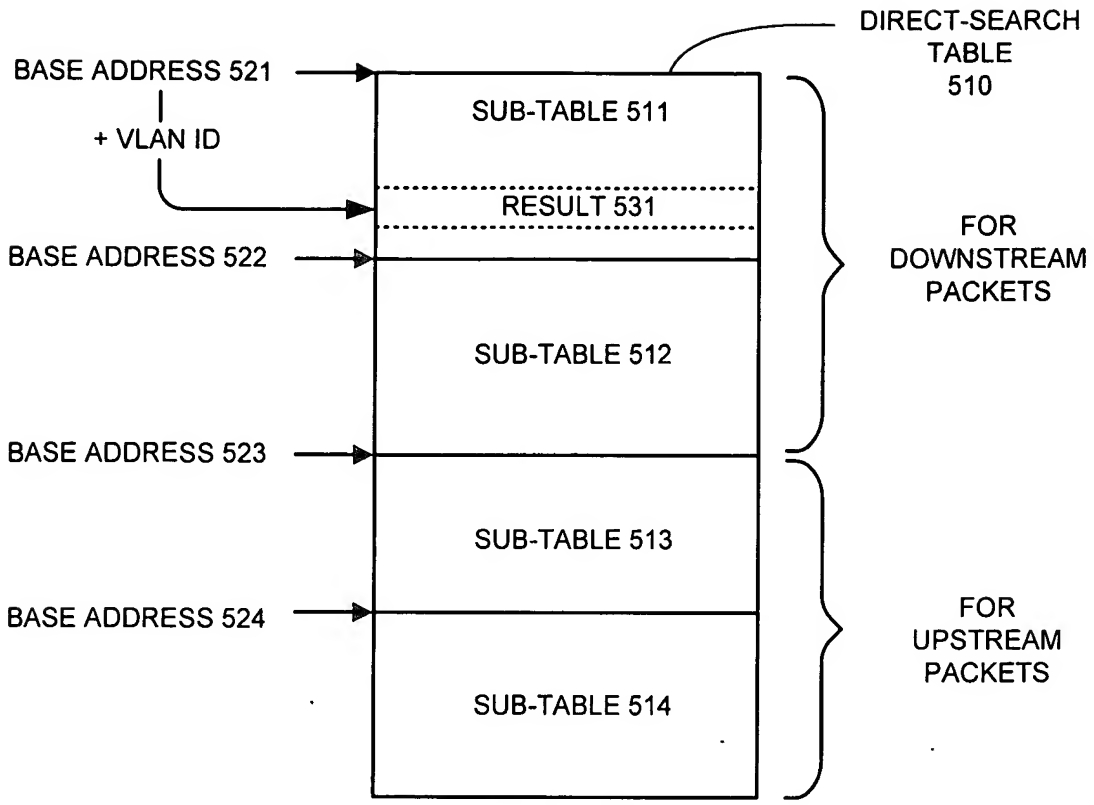
DIRECT-SEARCH TABLE 510
BASE ADDRESS 521
+ VLAN ID
SUB-TABLE 511
RESULT 531
BASE ADDRESS 522
SUB-TABLE 512
FOR DOWNSTREAM PACKETS
BASE ADDRESS 523
SUB-TABLE 513
BASE ADDRESS 524
SUB-TABLE 514
FOR UPSTREAM PACKETS

FIG. 5

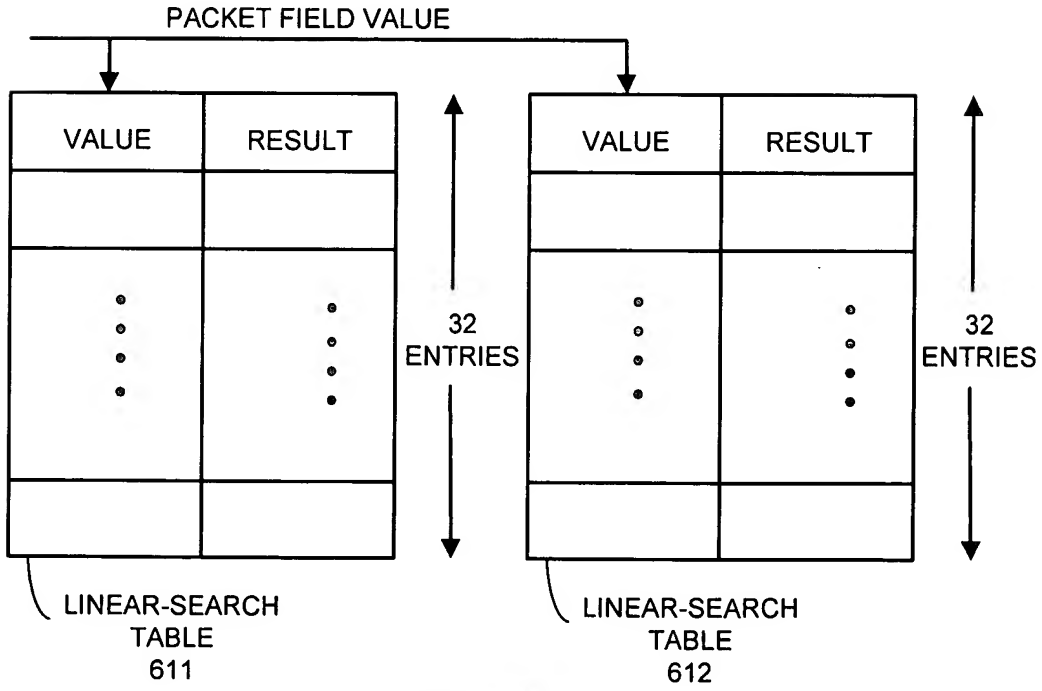
PACKET FIELD VALUE
VALUE
RESULT
32 ENTRIES
VALUE
RESULT
32 ENTRIES
LINEAR-SEARCH TABLE 611
LINEAR-SEARCH TABLE 612

FIG. 6

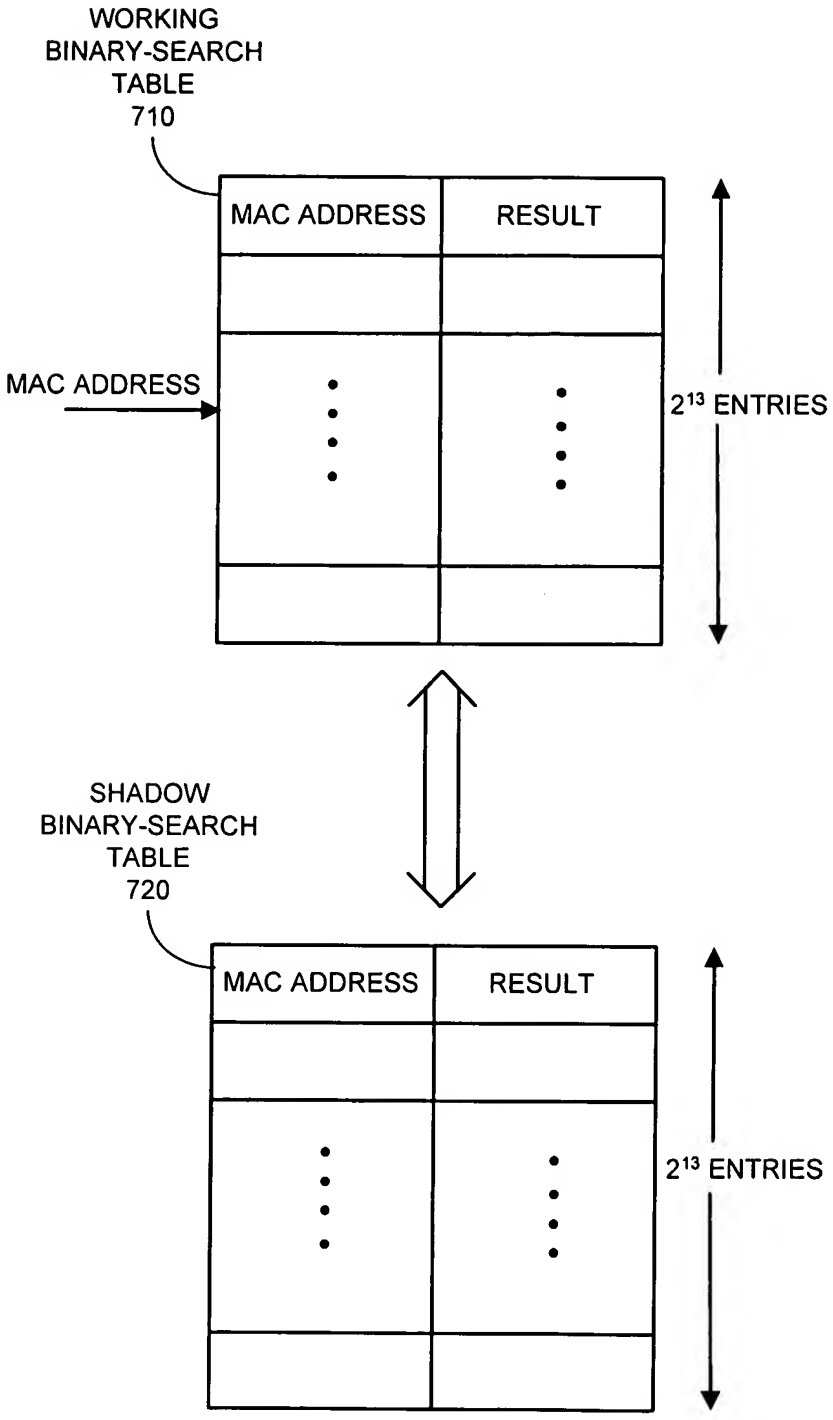
WORKING
BINARY-SEARCH
TABLE
710
MAC ADDRESS
RESULT
MAC ADDRESS
2^13 ENTRIES
SHADOW
BINARY-SEARCH
TABLE
720
MAC ADDRESS
RESULT
2^13 ENTRIES

FIG. 7

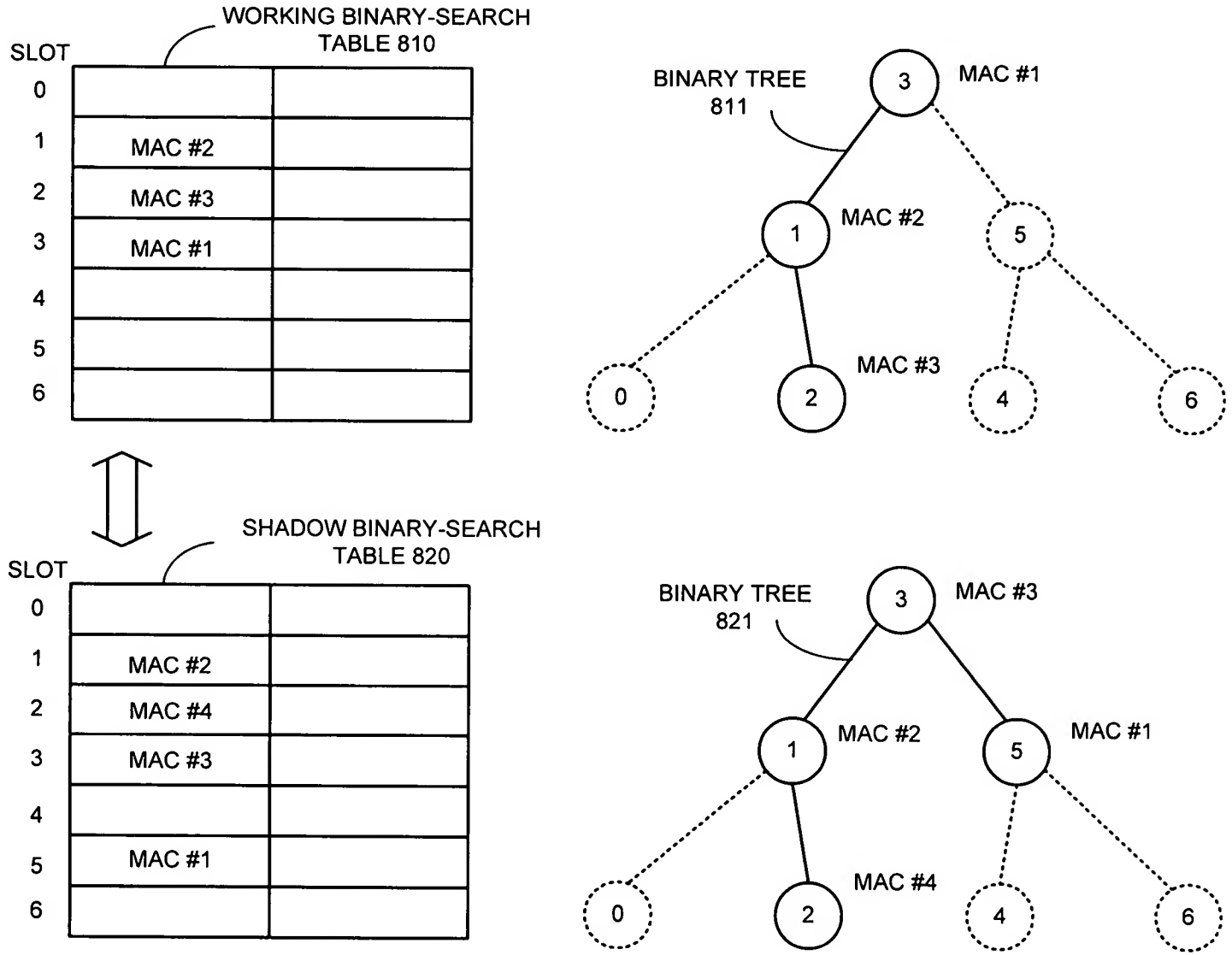
WORKING BINARY-SEARCH TABLE 810
SLOT
0
1
2
3
4
5
6
MAC #2
MAC #3
MAC #1
BINARY TREE 811
3
MAC #1
1
MAC #2
5
0
2
MAC #3
4
6
SHADOW BINARY-SEARCH TABLE 820
SLOT
0
1
2
3
4
5
6
MAC #2
MAC #4
MAC #3
MAC #1
BINARY TREE 821
3
MAC #3
1
MAC #2
5
MAC #1
0
2
MAC #4
4
6

FIG. 8

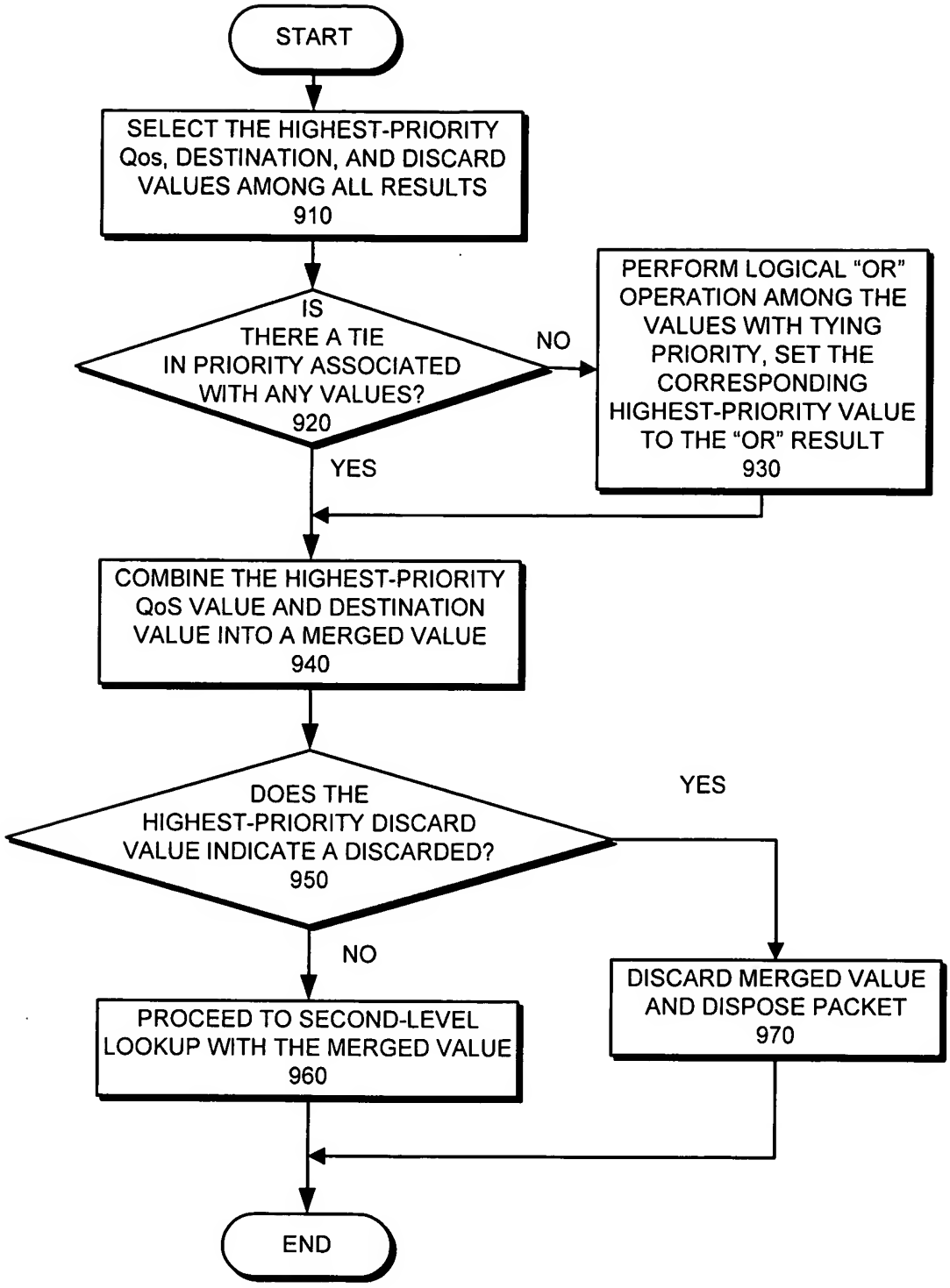
START
SELECT THE HIGHEST-PRIORITY Qos, DESTINATION, AND DISCARD VALUES AMONG ALL RESULTS 910
IS THERE A TIE IN PRIORITY ASSOCIATED WITH ANY VALUES? 920
NO
PERFORM LOGICAL "OR" OPERATION AMONG THE VALUES WITH TYING PRIORITY, SET THE CORRESPONDING HIGHEST-PRIORITY VALUE TO THE "OR" RESULT 930
YES
COMBINE THE HIGHEST-PRIORITY QoS VALUE AND DESTINATION VALUE INTO A MERGED VALUE 940
DOES THE HIGHEST-PRIORITY DISCARD VALUE INDICATE A DISCARDED? 950
YES
NO
DISCARD MERGED VALUE AND DISPOSE PACKET 970
PROCEED TO SECOND-LEVEL LOOKUP WITH THE MERGED VALUE 960
END

FIG. 9

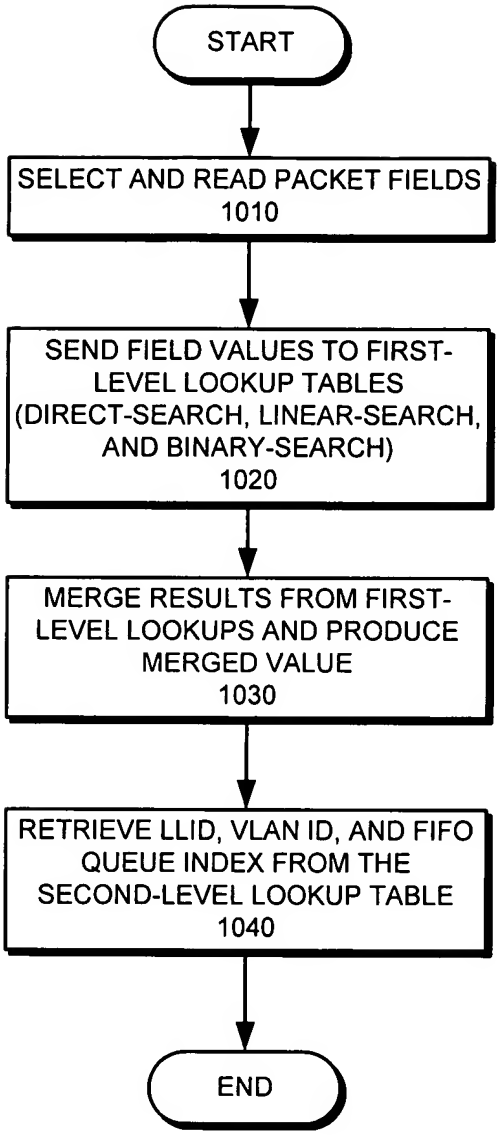
START
SELECT AND READ PACKET FIELDS
1010
SEND FIELD VALUES TO FIRST-LEVEL LOOKUP TABLES (DIRECT-SEARCH, LINEAR-SEARCH, AND BINARY-SEARCH)
1020
MERGE RESULTS FROM FIRST-LEVEL LOOKUPS AND PRODUCE MERGED VALUE
1030
RETRIEVE LLID, VLAN ID, AND FIFO QUEUE INDEX FROM THE SECOND-LEVEL LOOKUP TABLE
1040
END

FIG. 10